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Daylight Saving Time

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The first daylight saving period of the millenium will occur at 2:00 a.m. Sunday, April 2nd. The spring ritual of advancing our clocks by an hour will be marked by the loss of an hour's sleep and the inevitable latecomers to church. This backgrounder will examine basic questions, history and interesting facts related to both Daylight Saving Time and Standard Time.

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Introduction ▲

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What is Daylight Saving Time? ▲

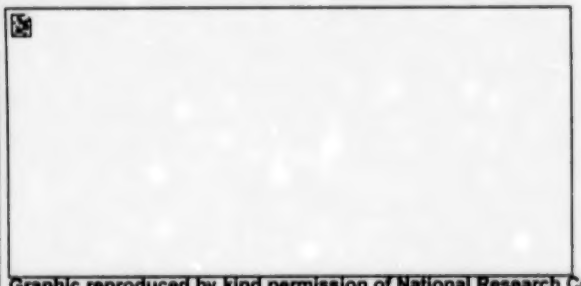
The practice of advancing the clock one hour ahead of Standard Time for a period of approximately six months is known as Daylight Saving Time (DST). Daylight Saving Time, also known as "summer time" in some countries, is a deviation of Standard Time. In Canada and the United States, it begins at 2:00 a.m. on the first Sunday of April and ends at 2:00 a.m. on the last Sunday of October. DST is observed to provide a longer period of daylight during summer evenings and to realize financial savings by conserving fuel and energy.

What is Standard Time?

Standard Time was created by Sir Sanford Fleming, a Canadian railroad planner, engineer and citizen of Peterborough, Ontario. Prior to the establishment of Standard Time, local time was set by the position of the sun at midday (solar time). As a result, time varied from community to community. The development of the railways in the mid-19th century brought local time in one community at odds with local time in another. This led to much confusion and annoyance in terms of scheduling.

> Before Sandford Fleming invented Standard Time, 12 p.m. in Kingston was twelve minutes later than 12 p.m. in Montreal and thirteen minutes before 12 p.m. in Toronto. Noon was the time when the sun stood exactly overhead. This was the way clocks were set all over the world. In the old days, locally-based time made sense to everyone, but with the introduction of railways, it became highly inconvenient and inefficient. Imagine travelling across the country by train. At every stop along the way, you would have to reset your time piece by the local clocks. Travellers sometimes carried a number of watches, or one with six different faces, each labelled with the name of a different city. It was also a nightmare for railway station-masters, who could not deal with train schedules based on local time. The result was chaos for a transcontinental railway.[1]

Sir Sanford Fleming (1827 – 1915)



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Resources

(underlined text links to a web document)

Sir Sandford Fleming
Canadian Science and Engineering Hall of Fame

The CRB Foundation Heritage Project, "Sandford Fleming makes trains run on time"

Lawrence J. Burpee, ***Sir Sanford Fleming Empire Builder***, [London]: Oxford University Press, 1915.

Hugh Maclean, ***Man of Steel The Story of Sir Sandford Fleming***, (Toronto: the Ryerson Press, 1969)

Lorne Edmond Green, ***Sandford Fleming, The Canadians*** (Don Mills: Fitzhenry & Whiteside Limited, 1980).

Doris J. Unitt, Andrew Osler, Edward McCoy, ***Sir Sandford Fleming*** (Peterborough: Review Printing Co. Ltd., 1968).

The solution was to adopt a system where the clocks would read consistently in one large region. In the late 1870s, Sanford Fleming advocated the adoption of a world-wide standard or mean time. He was instrumental in convening an International Prime Meridian Conference in Washington in1884 at which the system of international Standard Time was adopted with 24 meridians, each 15 degrees (one hour) apart in longitude, starting from Greenwich, England, the prime meridian. Each time zone would keep the local time of the meridian that bisected it.

Standard Time zones were first used by the railroads in the United States and Canada on November 18, 1883. Standard Time was not enshrined into U.S. law, however, until March 19, 1918 when the *Standard Time Act* came into force.[2]

Standard Time Resources

(underlined text links to a web document)

The New Encyclopaedia Britannica, Volume 11, 15th ed., Micropaedia (Chicago: Encyclopaedia Britannica, 1998), p.208.

Ian R. Barkky and Elizabeth Harrison, "Standard and Daylight Saving Time," *Scientific American,* Vol. 240 No. 5 (May 1979), pp. 46-53.

"Timed by the zone" Write to Know – Answers to Readers' Perplexing Questions, *Canadian Geographic*, 1998.

The time zones of Canada

There are six time zones in Canada – Newfoundland Standard Time (NST) 3 ½ hours from the Greenwich meridian; Atlantic Standard Time (AST) 4 hours from Greenwich; Eastern Standard Time (EST) 5 hours from Greenwich; Central Standard Time (CST) 6 hours from Greenwich; Mountain Standard Time (MST) 7 hours from Greenwich; Pacific Standard Time (PST) 8 hours from Greenwich.

Map reproduced with the kind permission of the Institute for National Measurement Standards, National Research Council of Canada. Click for a better view or more information.

Newfoundland's unique time zone

Many people wonder why the Province of Newfoundland has a time zone that varies by the half hour rather than the standard one hour. While the system of Standard Time employs 24 meridians, and each are theoretically the centres of 24 Standard Time zones, some adjustments have been made to the time zones for the convenience of inhabitants that lie within the zones. Newfoundland, (but not Labrador), lies squarely in the eastern half of its time zone, exactly three and a half hours from Greenwich. The Newfoundland government attempted to bring the province into conformity with the other Atlantic provinces in 1963, but withdrew in the face of stiff public opposition. Other countries that operate on the half hour time difference are: Suriname, Iran, India, Sri Lanka, and Central Australia.[3]

Brief History of Daylight Saving Time

One of the first references to saving daylight was made in 1784 by Benjamin Franklin in a humourous essay entitled *Turkey vs. Eagle, McCauley is my Beagle*. Next, in 1907 William Willett, a London builder proposed setting clocks ahead by 80 minutes in four moves of 20 minutes each during the spring and summer. In his pamphlet called *The Waste of Daylight*, he wrote,

> Everyone appreciates the long, light evenings. Everyone laments their shortage as Autumn approaches; and everyone has given utterance to regret that the clear, bright light of an early morning during Spring and Summer months is so seldom seen or used.[4]

An initiative of the British Parliament in 1908 to advance the clock by one hour in the spring and return to Greenwich mean time in the fall was rejected. In 1916, an act was introduced in the British Parliament entitled *British Summer Time*. Clocks were advanced one hour ahead of Greenwich Mean Time during the summer months. During the first World War, clocks in several countries, including Australia, Great Britain, Germany and the United States were advanced one hour in an effort to save energy used for artificial lighting. In the United States, the measure was unpopular, so it was repealed after the war. During the Second World War, Congress reinstated DST from February 2nd 1942 until September 30th 1945. England used "double summer time", advancing the clocks two hours from Standard Time in the summer and one hour in the winter. In Canada, federal legislation established DST during a limited portion of the Second World War.

Between 1945 and 1966, there was no federal law regulating DST, and the U.S. allowed state and municipalities to observe DST or not. This brought confusion to industries in the transportation and communications sector. Trains and buses had to publish new schedules each time a state or town began or ended DST. By 1966 100 million Americans were observing DST through local laws. Congress decided to end the confusion and establish one pattern across the country with the Uniform Time Act of 1966 (U.S. Code, Title 15, Section 260a). The legislation decreed that DST would begin on the last Sunday of April and end on the last Sunday of October. The U.S. Department of Transportation has jurisdiction over DST in the United States.[5]

In response to the Arab oil embargo, in 1974 and 1975 Congress placed the country on year-round DST on a trial basis in an effort to conserve energy and to explore what advanced-time period would be most acceptable to the country.[6] Congress discontinued the extended DST period in 1975 due to opposition from the farming states and reinstated the six month practice. At the conclusion of the two year trial period, the U.S. Department of Transportation concluded that DST saves energy, prevents traffic injuries (except for the months of November through February), and reduces peoples' exposure to crime. In 1986, President Reagan amended the legislation to extend DST three weeks earlier, to the first Sunday of April. No change was made to the end date. This was done to realize additional savings of barrels of oil. Today, the change to DST on the first Sunday in April and the last Sunday in October, also marks the more recent, semi-annual ritual where households are encouraged to change the nine volt batteries in their smoke alarms.[7]

Daylight Saving Time Resources

(underlined text links to a web document)

The New Encyclopaedia Britannica, Volume 3, 15th ed., Micropaedia (Chicago: Encyclopaedia Britannica, 1998.), p.925.

The Canadian Encyclopaedia, Volume 4, 2nd ed., (Edmonton: Hurtig Publishers, 1988), pp. 2162-3.

Bob Aldrich, Information Officer, California Energy Commission, "Saving Time, Saving Energy: Daylight Saving Time, Its History and Why We Use It," (May 13, 1999).

Dynamic Educational Advancement (IDEA), WebExhibits, "Daylight Saving Time – First there was Standard Time"

Do all Canadian provinces observe DST?

All provinces but Saskatchewan observe DST. Saskatchewan's *Time Act* establishes that Central Standard Time shall be used and observed in the province throughout the year in eastern Saskatchewan and northeastern Saskatchewan. Central Standard Time is also observed and used throughout the year in northwestern Saskatchewan except for those areas where a majority of voting citizens elect to observe a time other than Central Standard Time. Saskatchewan's *Time Act* establishes "time option areas" in western Saskatchewan in which residents observe Central Standard Time during the summer period from the first Sunday in April until the last Sunday in October, and Mountain Standard Time in the winter from the last Sunday in October to the first Sunday in April, (unless a majority of the electors in a time option area vote in favour of observing Central Standard Time in the winter period as well).[8]

Some Saskatchewan officials have observed that, prior to 1966, Saskatchewan presented the most complicated time picture of any province in Canada. This was partly due to the fact that the Standard Time zone split the Province. The area east of the 105th Meridian is Central Standard Time, while the area west of it is in Mountain Standard Time. Urban voters favoured Central Standard Time while rural voters favoured Mountain Standard Time. Citizens were similarly split on the question of Daylight Saving Time.. In 1966 *The Time Act* established the current system. Today, Daylight Saving Time is observed in Saskatchewan in only a small number of communities – the City of Lloydminster, and the Battle River Time Option Area.[9]

In the U.S., all states observe DST except for the Eastern Time Zone portion of the State of Indiana, most of Arizona (except the Navajo Indian Reservation in Arizona), Hawaii, American Samoa, Guam, Puerto Rico, and the Virgin Islands.

Who regulates DST in Canada?

While the federal government regulated DST as national policy during the Second World War, and municipal governments had jurisdiction thereafter, provincial governments now regulate it through the following statutes.

Province	Title of Act	Department / Ministry that administers Act
British Columbia	*Interpretation Act*	Attorney General
Alberta	*Daylight Saving Time Act*	Justice
Saskatchewan	*The Time Act*	Municipal Affairs, Culture and Housing
Manitoba	*The Official Time Act*	Rural Development
Ontario	*The Time Act*	Attorney General
Quebec	*The Official Time Act*	Justice
New Brunswick	*The Time Definition Act*	Premier's Office
Nova Scotia	*The Time Definition Act*	Justice
Prince Edward Island	*Time Uniformity Act*	Community Services and Attorney General
Newfoundland and Labrador	*An Act Respecting Standard Time and Daylight Time in the Province*	Municipal and Provincial Affairs

Other Countries that observe DST

Approximately 70 countries world-wide observe DST. (See map). But the dates that other countries observe DST varies. In 1996, the European Union (EU) standardized a EU wide "summertime period" which extends from the last Sunday in March through the last Sunday in October. In Britain, "summer time" starts on March 30th and ends on October 26th. In Israel, DST is determined on a yearly basis, because religious considerations dictate that DST must end before the New Year. This can fall any time between early September and early to mid October. During the summer, Russia advances its clocks two hours ahead of Standard Time. During the winter, all 11 of the Russian time zones are one hour ahead of Standard Time. In the southern hemisphere, where summer arrives in December, DST is observed from October to March. Equatorial and tropical countries do not observe DST since day and night are equal throughout the seasons.[11]

Why "Daylight Saving Time" instead of "Daylight Savings Time"?

There is no "s" because the term refers to saving daylight which is singular.

Why not observe DST year round?

While some people would like DST year-round, there are practical reasons for avoiding it during the late sunrise months of November through February. At the conclusion of the two year trial period in the U.S. in 1974-75, data compiled showed a statistically significant increase in fatal traffic accidents between 5:30 and 9:30 a.m. during the late sunrise months of January and February 1974, compared with 1973. While the increase in accidents cannot be definitively attributed to Daylight Saving Time, DST as a factor in these accidents cannot be ruled out either.[12] The morning darkness was and remains a concern for parents whose children wait for school buses or walk to school in the morning during November through February. In the rural communities, there is concern when young children have to travel down lengthy lane ways to catch the school bus.[13] Daylight Saving Time is most acceptable to the public when sunrises are not too late and sunsets are not too early.[14] Some experts believe that the best period for DST in terms of light symmetry, is the six month period starting on the first Sunday in April and ending

on the last Sunday in September.[15]

In 1985, the Member for Bellwoods, (Ross McClellan) pointed out during debate on his Private Member's Bill, the *Time Amendment Act*, the benefits of extending Daylight Saving Time from the first Sunday in April to the first Sunday in November. The latter would, he argued, provide increased daylight for Hallowe'en celebrants and build in a measure of traffic safety.[16]

Opposition to Daylight Saving Time

Earlier this century, farmers were opposed to Daylight Saving Time as it was more convenient to do their chores in the morning light. Farmers have historically been opposed to Daylight Saving Time because their rising patterns had more to do with the rhythms of their agricultural vocation than the hour on the clock. DST is no longer a contentious issue among farmers, however, because the pervasive use of electricity and artificial light permits them to work in the absence of sunlight. Opposition to DST has been dropped from the U.S. Farm Bureau's policy book within the last five years.[17]

Some people resent the twice a year inconvenience of adjusting their alarm clocks, and resetting the clocks on their various appliances.[18] Others dislike adjusting their sleeping patterns and find the change disruptive and disorienting. They complain that adjusting to DST or back to Standard Time is "like getting jet lag without even leaving home." [19]

A neuropsychologist in British Columbia published a study claiming that the time change in the spring and fall increases driver fatigue resulting in an increase in automobile collisions in the weeks following the start/end of DST. But these claims are disputed by other experts.[21]

Several economists from British Columbia have suggested that disrupted sleep routines lead to unusual declines on the stock market on the Monday following the start/end of DST.[22]

Finally, Robertson Davies, who wrote under the pseudonym Samuel Marchbanks for the *Peterborough Examiner* in the 1940s, made these whimsical observations about Daylight Saving Time.

> Went cheerfully through the whole day without realizing that the usual haphazard tinkering with the clocks was in progress, and that I should have been enjoying the benefits of Daylight Saving Time. I don't really care how time is reckoned so long as there is some agreement about it, but I object being told that I am saving daylight when my reason tells me that I am doing nothing of the kind. I even object to the implication that I am wasting something valuable if I stay in bed after the sun has risen. As an admirer of moonlight I resent the bossy insistence of those who want to reduce my time for enjoying it. At the back of the Daylight Saving scheme I detect the bony, blue-fingered hand of Puritanism, eager to push people into bed earlier, and get them up earlier, to make them healthy, wealthy and wise in spite of themselves.[23]

Notes

[1]The CRB Foundation Heritage Project, "Sandford Fleming makes trains run on time" Internet site at http://heritageproject.ca/media/minutes/expanded/ssflem.htm accessed on October 4, 1999.

[2]Dynamic Educational Advancement (IDEA), WebExhibits, "Daylight Saving Time – First there was Standard Time"
Internet site at http://www.webexhibits.com/daylightsaving/d.html accessed on October 4, 1999.

[3]"Timed by the zone" Write to Know – Answers to Readers' Perplexing Questions, *Canadian*

Geographic, 1998.
Internet site at http://www.canadiangeographic.ca/JF98Write.htm accessed on July 12, 1999.

[4]Dynamic Educational Advancement (IDEA), WebExhibits, "Daylight Saving Time – Rationale and Original Idea"
Internet site at http://www.webexhibits.com/daylightsaving/d.html accessed on October 4, 1999.

[5]Bob Aldrich, Information Officer, California Energy Commission, "Saving Time, Saving Energy: Daylight Saving Time, Its History and Why We Use It," May 13, 1999.
Internet site at http://www.energy.ca.gov/daylightsaving.html accessed on July 9, 1999.

[6]Ian R. Barkky and Elizabeth Harrison, "Standard and Daylight-saving Time," *Scientific American* (May 1979), p. 50.

[7]Bob Aldrich, Information Officer, California Energy Commission, "Saving Time, Saving Energy: Daylight Saving Time, Its History and Why We Use It," May 13, 1999.
Internet site at http://www.energy.ca.gov/daylightsaving.html accessed on July 9, 1999.

[8]Correspondence from Acting Chief Electoral Officer, Province of Saskatchewan (28 January 1998).

[9]Ibid.

[10]The *New Encylopaedia Britannica*, Volume 3, 15th ed., Micropaedia (Chicago: Encyclopaedia Britannica, 1998.).

[11]Bob Aldrich, Information Officer, California Energy Commission, "Saving Time, Saving Energy: Daylight Saving Time, Its History and Why We Use It," May 13, 1999.
Internet site at http://www.energy.ca.gov/daylightsaving.html accessed on July 9, 1999.

[12]Ian R. Barkky and Elizabeth Harrison, "Standard and Daylight-saving Time," *Scientific American* (May 1979), p. 50.

[13]Ontario, Legislative Assembly of Ontario, *Hansard: Official Report of Debates*, 33rd Parliament, 1st Session (12 December 1985): 2368.

[14]Ian R. Barkky and Elizabeth Harrison, "Standard and Daylight-saving Time," *Scientific American* (May 1979), p. 50.

[15] Ibid., p. 53.

[16]Ontario, Legislative Assembly of Ontario, *Hansard: Official Report of Debates*, 33rd Parliament, 1st Session (12 December 1985): 2362.

[17]Paul Wood, "Changing clocks a sore subject," *The News-Gazette Online* (Champaign, Illinois) (1998),.
Internet site at http://www.news-gazette.com/story.cfm?Number=2495 accessed on October 7, 1999.

[18]Sheila Danzig "End Daylight Saving time", 1997.
Internet Site at http://www.standardtime.com accessed on July 9, 1999.

[19]Paul Wood, "Changing clocks a sore subject," *The News-Gazette Online* (Champaign, Illinois) (1998).

Internet site at http://www.news-gazette.com/story.cfm?Number=2495.

[20]"Daylight Saving Time Linked to Increase in Auto Collisions" *News Release*, Alberta Motor Association (98/04/08).
Internet site at http://www.ama.ab.ca/trafsafe/mp_news_release.arc/n980408.htm accessed on July 9, 1999.

[21]Nicolas van Rijn, "Accident unrelated to time change: study – Statistics show losing sleep has little or no effect, "*Toronto Star*, 17 October 1998, p. A.4.

[22]"Beware stocks and daylight saving" Simon Fraser University *News Release*, 1 April 1999.
Internet site at http://www.sfu.ca/mediapr/Releases/News/1999/April1999/Daylight.html accessed on July 9, 1999.

[23]Robertson Davies, *The Papers of Samuel Marchbanks* (New York: Viking Penguin, 1986), pp. 75-76.

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